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## DROUGHTS IN ARKANSAS

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In order to study droughts in Arkansas, it was necessary first to decide what should there be considered a drought. A short, dry period that might cause damage in summer would do little or no damage in winter, because evaporation is so much greater in summer than in winter and because the rank growth in summer takes moisture from the soil more rapidly than the scant vegetation in winter. It was found also that a short, dry period that would cause damage in the hills would do no harm in the delta country. The kind of crops raised also make a decided difference as to whether or not any damage is done.

Many pages of data on dry periods on Arkansas were tabulated and studied in connection with weather and crop reports. They were also studied in connection with correlations of corn production and precipitation by Mr. J. Warren Smith; with the effects of droughts in New York as found by Mr. C. D. Reed; and with the facts set out in other papers on droughts. Mr. Smith found that 10 days without rain at and just following the time corn is tasseling reduces the yield appreciably, but that at any other time such a short period has little or no effect on the yield. It is considered unnecessary to tabulate 10-day periods as they only affect very delicate vegetation at a critical period for a very small portion of the year. If they do not occur at one of these critical periods very little harm is done. The large increase in the number of entries of short periods in the tables would not be warranted by any use we see for them.

The tabulations were laid aside for several years, but in the meantime the writer was studying the comments of the weather and crop correspondents on the effect of dry weather on different crops in different portions of Arkansas. The first tabulations were discarded and only used for checking purposes. Twelve stations, as well distributed as practical and having records from 1897 to 1930, inclusive, or as near that as could be found, were selected. In some instances it was necessary to use data for a nearby station, the substitutions being indicated by notes. The stations selected were as follows: Arkansas City, Camden, Calico Rock, Dardanelle, Fort Smith, Fulton, Helena, Little Rock, Mena, Newport, Pocahontas, and Rogers.

It was decided to use all 15-day periods without measurable rainfall during the warmer months, May to September, inclusive, and to use 20-day periods without measurable precipitation during the remainder of the year. It was also decided that periods of over 15 days during the warmer months should be included if the rainfall for the additional days was at a rate less than 1 inch for each additional 15 days and during the remainder of the year dry periods of over 20 days should be included if the precipitation for the additional days was at a rate less

than one inch for each additional 30 days. The above rules must be applied with judgment. A 4-inch rain in the middle of a long drought in the warm season will not mature any crops, therefore will not break a drought. Four 1-inch rains, a week or slightly farther apart, will produce good pasture and a hay crop and mature several kinds of truck, and therefore should be considered as breaking the drought.

For convenience in selecting the dry periods two straight lines were drawn on cross section paper, the one for use in the months May to September, the other for the colder months. Days were used as abscissas and amounts of rainfall for ordinates. The line for warm months was

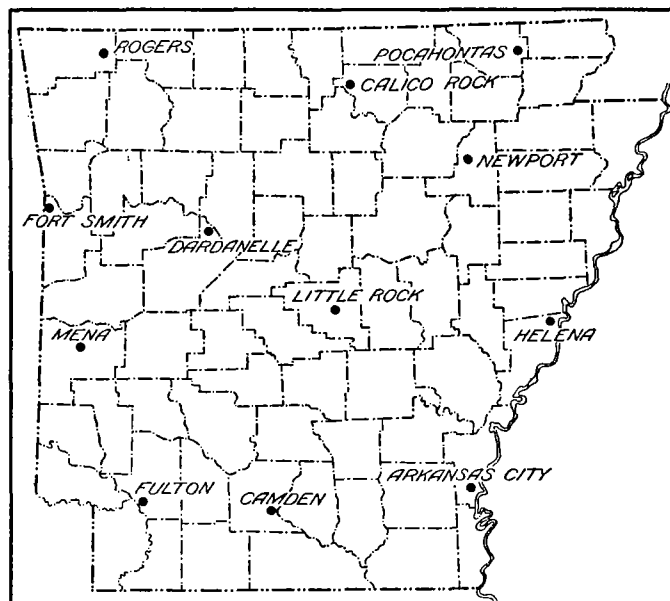


FIGURE 1.—Showing stations in Arkansas whose records were used in this paper

drawn from the point indicating 15 days through the intersection of the lines for 30 days and 1 inch rainfall. The line for the colder months was drawn from the point indicated by 20 days through the intersection of the lines for 50 days and 1 inch of rainfall. These lines were extended as far as needed. Such graphs were also found very useful in comparing one drought with another.

The data used in the preparation of the accompanying tables were obtained from the daily rainfall tables printed in the Weather Bureau bulletins containing monthly climatological data for Arkansas, except in a few instances where the original forms were not received in time to be printed. In such cases, the data were obtained from the original forms.

Table I shows the dates of beginning and ending of all droughts, the number of days duration, the daily amounts of rainfall within the droughts and their dates, and the total precipitation that occurred during the droughts. The droughts for each of the 12 stations are arranged in chronological order for the 33 years.

Table II shows the number of droughts by months in 33 years at the 12 stations for the different durations, 15 to 19 days, 20 to 29 days, 30 to 39 days, etc., to 99 days and for 100 days or more. These numbers were totaled by months and year and the average number of periods per station per month and per year were determined.

Table III gives the number of droughts at each station for the different durations, 15 to 19 days, 20 to 29 days, etc., to 100 days or more, also the greatest droughts on record with the dates of beginning and the amounts of precipitation. The different columns were totaled and the sums divided by 396 (number of years times number of stations), giving the average number of periods of the different durations per station per year.

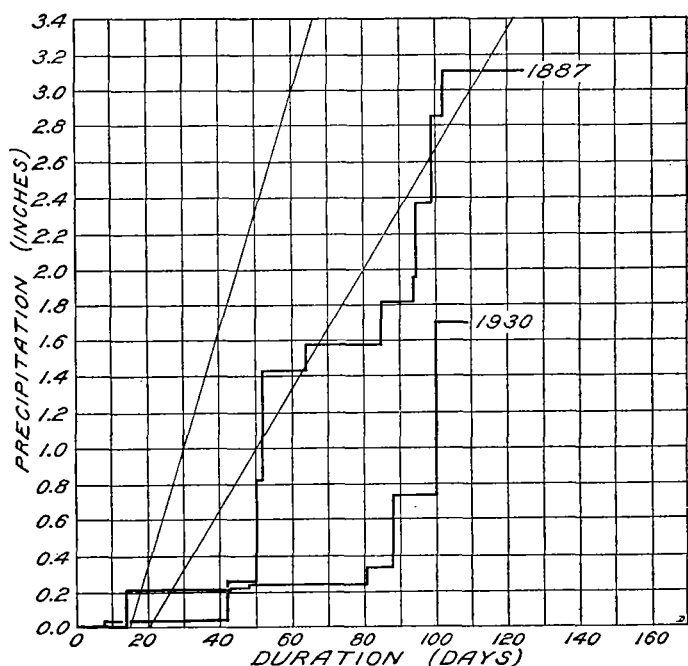


FIGURE 2

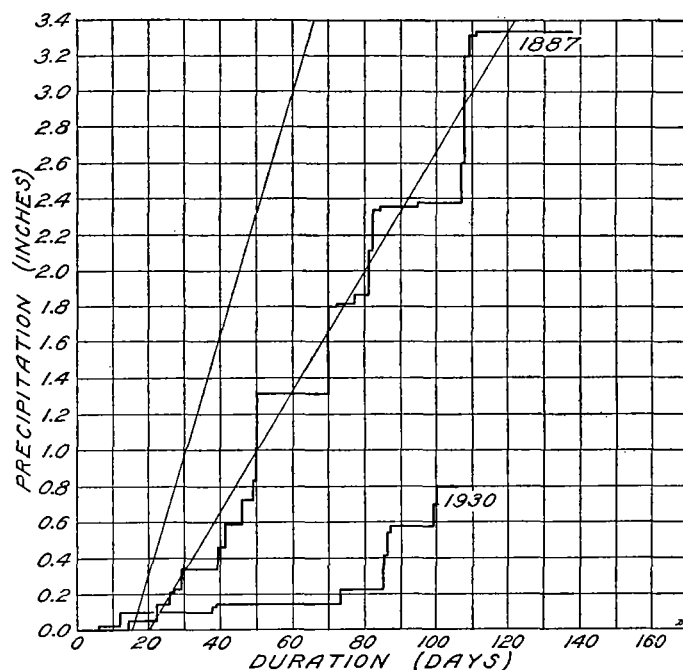


FIGURE 3

Table IV shows the number of droughts in 33 years at each station for 15 days or more, 20 days or more, 30 days or more, etc., up to 100 days or more. These columns were totaled and divided by 396 to determine the number of droughts of different duration per year and the reciprocals of these computed to determine the average number of years per drought of different durations.

Droughts were recorded 844 times at the 12 stations in 33 years, making 2.13 per station per year. Many of these were of short duration, injuring only a few of the many crops. Of these 204 continued from 15 to 19 days with no rain, 365 continued from 20 to 29 days with less than an inch rainfall. The number decreased rapidly from these droughts of short duration to those of longer duration, only 5 of which lasted 90 to 99 days. This would be at a rate of 1 drought of 15 days or more per station in 0.47 year, 1 drought of 20 days or more per station in 0.62 year, 1 of 30 days or more in 1.40 years, 1 of 40 days or more in 2.56 years, 1 of 50 days or more in 3.85 years, 1 of 60 days or more in 6.25 years, 1 of 70 days or more in 8.33 years, 1 of 80 days or more in 14.29

years, 1 of 90 days or more in 25 years, and 1 of 100 days or more in 40 years. Note that we do not have many droughts of 100 or more days. The geographical distribution of droughts varies considerably. The southern section has more droughts than the northern, 93 being recorded at Arkansas City, 70 at Camden, and 83 at Fulton. In the central section, we have 62 at Helena, 58 at Little Rock, 91 at Dardanelle, 65 at Mena, and 66 at Fort Smith. In the northern section 50 were recorded at Pocahontas, 68 at Newport, 75 at Calico Rock, and 63 at Rogers.

Mena is near the Plains States and south of the center of the State where we would expect light rainfall and a large number of droughts, but the average annual precipitation at Mena is over 52 inches, while that for the State as a whole is less than 48. Mena is on a south slope of Rich Mountain which accounts for its heavy rainfall and smaller number of droughts than would be expected. Automatic gages at Little Rock and Fort Smith assure the recording of all amounts of 0.01- or

0.02-inch rainfall. Many of these small amounts are evaporated at substations and recorded as traces. Dardanelle, with 91 droughts, is located 4 miles east-northeast of Mount Nebo, which position accounts for its relatively scanty rainfall and large number of droughts. The heavier rains reach Dardanelle, but the lighter ones do not. Dardanelle and Fort Smith had the same number of 40-day droughts, but Dardanelle had 24 more 15- to 29-day droughts than Fort Smith. The large number of droughts at Calico Rock is accounted for by the fact that there are small mountains south and west of the station.

Ten droughts of 100 days or more were recorded at the 12 stations in the 33-year period. Dardanelle and Fulton had two each. Arkansas City, Fort Smith, Helena, Little Rock, Pocahontas, and Rogers had one each, and Camden, Calico Rock, Mena, and Newport, had none. The longest duration was 126 days at Fulton in 1897, the second longest was 125 days at Dardanelle in 1897. The longest duration in 1930 was 109 days at Fulton, the next longest 107 days, at Little Rock. The longest

drought at Mena was 75 days, in 1930. All other stations had droughts of longer duration.

A drought of longer duration than any of those in the 33-year period occurred at Little Rock in 1887. This drought continued 138 days with 3.34 inches of rainfall. The drought of longest duration, however, is not always the most severe. The 107-day drought at Little Rock in 1930 with only 0.80-inch precipitation probably caused more serious destruction of vegetation and more inconvenience and suffering by men and animals than the 138-day drought at the same place with 3.34 inches rainfall in 1887. Droughts of 100 days or more at 8 stations having such droughts, and the longest droughts on record at the other 4 stations, occurred in the following years: 2 in 1897, 2 in 1901, 1 in 1903, 1 in 1909, 2 in 1910, 1 in 1914, 1 in 1929, and 4 in 1930. It will be noted that longer droughts over small areas have occurred several times since 1897, but such severe droughts have not occurred over nearly so large a portion of the State as those of 1930.

TABLE I.

## Arkansas City

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				Inches		Inches
1897.....	May 14	July 10	58	0.60	June 3	0.60
	July 22	Aug. 5	15	0.00		0.00
	Aug. 20	Oct. 30	72	0.60	Oct. 11	0.60
1898.....	Mar. 30	Apr. 18	20	0.00		0.00
	May 4	May 21	18	0.00		0.00
	May 24	June 9	17	0.06		0.06
	Aug. 7	Aug. 25	19	0.00		0.00
1899.....	Apr. 23	May 10	18	0.00		0.00
	Aug. 19	Nov. 21	95	0.45	Sept. 8	0.45
				0.20	Sept. 11	0.20
				1.20	Oct. 11	1.20
				0.10	Oct. 12	0.10
				0.35	Nov. 1	0.35
1900.....	Aug. 1	Oct. 20	81	0.01	Aug. 22	0.01
				0.05	Aug. 26	0.05
				0.01	Sept. 2	0.01
				0.04	Sept. 9	0.04
				2.02	Sept. 20	2.02
				0.05	Sept. 30	0.05
				0.02	Oct. 5	0.02
				0.03	Oct. 11	0.03
1900.....	Nov. 21	Jan. 8	49	0.09	Nov. 25	0.09
1901.....				0.03	Nov. 29	0.03
				0.03	Dec. 3	0.03
				0.02	Dec. 12	0.02
				0.35	Dec. 22	0.35
				0.03	Dec. 27	0.03
				0.01	Dec. 30	0.01
				0.02	Dec. 31	0.02
1901.....	Mar. 10	Apr. 9	31	0.02	Mar. 19	0.02
				0.02	Mar. 23	0.02
				0.01	Mar. 30	0.01
				0.05	Apr. 1	0.05
	Apr. 18	May 1	22	0.60	June 30	0.60
	June 7	Aug. 5	60	0.01	July 23	0.01
				0.05	July 24	0.05
				0.04	July 25	0.04
	Aug. 27	Sept. 10	15	0.00		0.00
	Sept. 17	Oct. 10	24	0.00		0.00
	Oct. 13	Nov. 20	39	0.10	Nov. 3	0.10
				0.02	Nov. 11	0.02
				0.04	Nov. 18	0.04
				0.02	Nov. 19	0.02
1902.....	Apr. 17	May 17	41	0.03	Apr. 16	0.03
				0.02	Apr. 23	0.02
				0.15	Apr. 25	0.15
				0.25	May 7	0.25
				0.10	May 12	0.10
	May 31	June 16	17	0.15	July 19	0.15
	June 19	July 26	38	0.15	Aug. 21	0.15
	Aug. 3	Aug. 31	29	0.45	Aug. 28	0.45
				0.01	Oct. 20	0.01
	Oct. 4	Nov. 3	31	0.14	Oct. 26	0.14
1903.....	May 14	May 29	16	0.10	Aug. 30	0.10
	Aug. 21	Dec. 3	105	0.20	Sept. 13	0.20
				0.20	Sept. 18	0.20
				0.30	Oct. 5	0.30
				0.12	Oct. 6	0.12
				0.30	Oct. 8	0.30
				0.30	Oct. 13	0.30
				0.70	Nov. 17	0.70
1904.....	May 18	June 3	17	0.00		0.00
	Sept. 3	Sept. 21	19	0.00		0.00
	Oct. 7	Nov. 1	26	0.00		0.00

TABLE I—Continued

## Arkansas City—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				Inches		Inches
1905 <sup>1</sup> .....	July 26	Aug. 12	18	0.00		0.00
	Aug. 24	Sept. 10	18	0.00		0.00
1906.....	Jan. 23	Feb. 20	29	0.00		0.00
	May 7	May 24	18	0.00		0.00
	May 28	June 13	17	0.00		0.00
	Oct. 19	Nov. 17	30	0.00		0.00
1907.....	Feb. 5	Feb. 24	20	0.00		0.00
	July 31	Aug. 25	26	0.00		0.00
	Sept. 16	Oct. 4	19	0.00		0.00
	Oct. 9	Oct. 30	22	0.00		0.00
	No drought in December at Montrose (nearest station)					
1908.....	Feb. 26	Mar. 19	23	0.00		0.00
	June 15	June 29	15	0.00		0.00
	Aug. 26	Sept. 27	33	0.20	Sept. 5	0.20
				0.06	Sept. 20	0.06
	Sept. 29	Nov. 10	43	0.40	Oct. 24	0.40
1909.....	July 9	Sept. 20	74	0.16	July 23	0.16
				0.20	Aug. 7	0.20
				0.34	Aug. 8	0.34
				0.04	Aug. 12	0.04
				0.24	Aug. 15	0.24
				0.12	Aug. 25	0.12
				0.50	Sept. 11	0.50
				0.30	Sept. 14	0.30
1910.....	Apr. 18	May 3	16	0.40	Sept. 6	0.40
	Aug. 16	Oct. 3	49	0.06	Sept. 29	0.06
	Oct. 28	Dec. 12	46	0.01	Nov. 5	0.01
				0.18	Nov. 16	0.18
				0.16	Nov. 17	0.16
				0.18	Nov. 28	0.18
				0.01	Dec. 5	0.01
				0.04	Dec. 6	0.04
1911.....	Jan. 3	Jan. 22	20	1.00	May 21	1.00
	Apr. 29	June 18	51	0.02	Sept. 3	0.02
	Aug. 30	Oct. 9	41	0.00		0.00
1912.....	June 3	June 18	16	0.00		0.00
	Sept. 23	Oct. 17	25	0.00		0.00
	Nov. 8	Nov. 27	20	0.00		0.00
1913.....	June 22	July 10	19	0.16	July 3	0.16
	Aug. 24	Sept. 7	15	0.00		0.00
	Oct. 30	Nov. 27	29	0.04	Nov. 17	0.04
	Dec. 29					
1914.....	Jan. 29	June 13	36	0.11	Jan. 24	0.11
	May 9	June 13	36	0.12	May 19	0.12
				0.36	June 4	0.36
	June 18	July 3	16	0.15	Sept. 19	0.15
	Aug. 29	Sept. 22	25	0.00		0.00
	Oct. 14	Nov. 8	26	0.10	July 20	0.10
1915.....	July 10	Aug. 10	32	0.10	Aug. 2	0.10
				0.13	Aug. 7	0.13
	Aug. 28	Oct. 4	38	0.62	Sept. 21	0.62
				0.10	Sept. 30	0.10
	Oct. 20	Nov. 8	20	0.00		0.00
1916.....	Oct. 20	Nov. 8	20	0.00		0.00
1917.....	June 10	June 25	16	0.00		0.00
1918.....	Feb. 21	Mar. 18	23	0.00		0.00
	May 14	June 1	19	0.00		0.00
	July 30	Aug. 19	21	0.04	Aug. 8	0.04
1919.....	None					
1920.....	None					
1921.....	May 16	June 4	20	0.11	Oct. 27	0.11
	Oct. 4	Nov. 8	36	0.04	July 24	0.04
1922.....	July 20	Aug. 13	25	0.02	Aug. 4	0.02
				0.03	Aug. 23	0.03
	Aug. 18	Sept. 7	21	0.10	Oct. 2	0.10
	Sept. 18	Oct. 6	19	0.02	July 1	0.02
	Oct. 10	Oct. 31	22	0.02	July 11	0.02
1923.....	Sept. 22	Oct. 16	25	0.10	July 12	0.10
1924.....	June 18	Sept. 12	87	0.02	July 14	0.02
				0.10	July 15	0.10
				0.02	July 26	0.02
				0.10	July 30	0.10
				0.01	Aug. 8	0.01
				0.92	Aug. 12	0.92
				0.08	Aug. 17	0.08
				0.32	Aug. 18	0.32
				0.20	Aug. 25	0.20
				0.10	Sept. 2	0.10
				0.12	Sept. 9	0.12
	Sept. 23	Dec. 4	73	0.85	Nov. 9	0.85
				0.02	Nov. 12	0.02
				0.01	Nov. 15	0.01
				0.02	Nov. 27	0.02
1925.....	Mar. 20	May 9	51	0.08	Apr. 4	0.08
				0.05	Apr. 9	0.05
				0.26	Apr. 27	0.26
				0.03	May 8	0.03
	May 25	June 8	15	0.02	June 23	0.02
	June 20	July 13	24	0.10	July 6	0.10
	Aug. 15	Sept. 11	28	0.02	Aug. 16	0.02
				0.03	Aug. 22	0.03
	No drought in December at McGehee (nearest station).					

<sup>1</sup> Data for Lake Village used.

TABLE I—Continued

## Arkansas City—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1926.....	May 16	July 7	53	0.17 0.02 0.02 0.83 0.12 0.04 0.21 0.02	June 4 June 19 June 25 June 26 June 27 Sept. 6 Sept. 7 Sept. 15	0.27 0.00 0.00 0.10 0.00 0.00 0.00 0.02
	Aug. 28	Oct. 4	38			
1927.....	June 22	July 7	16			
	Sept. 4	Sept. 18	15			
	Oct. 13	Nov. 8	27	0.10	Nov. 3	
1923.....	June 24	July 8	15			
	July 29	Aug. 18	21			
	Sept. 2	Oct. 15	44	0.10	Oct. 6	
1929.....	June 15	July 5	21			
	Aug. 14	Sept. 5	23			
	Sept. 14	Oct. 3	20			
	Oct. 6	Oct. 30	25	0.02	Oct. 20	
1930.....	May 25	Aug. 10	78	0.20 0.14 0.06 0.12 0.74 0.59 0.37 0.33	June 6 June 7 July 3 July 15 July 23 July 24 July 25 Aug. 5	2.55

## Camden

1897.....	May 13	May 28	16	<i>Inches</i>		<i>Inches</i>
	July 27	Oct. 8	74	0.06 0.10 0.09 0.57 0.30 0.10	Aug. 5 Aug. 15 Aug. 18 Sept. 9 Sept. 13 Sept. 14	0.00 1.32
1898.....	Mar. 29	Apr. 18	21			
1899.....	Jan. 14	Feb. 8	26	0.01	Feb. 7	
	Sept. 19	Oct. 9	21			
	Oct. 29	Nov. 19	22			
1900.....	Jan. 10	Feb. 2	24			
	Sept. 3	Sept. 20	18			
1901.....	Apr. 19	May 9	21			
	June 9	July 17	39	0.10	July 5	
	Aug. 1	Aug. 19	19			
	Sept. 15	Oct. 3	19			
	Dec. 14					
1902.....	Jan. 4		22			
	May 31	June 17	18	0.04	June 8	
	Aug. 9	Sept. 10	33	0.14	Sept. 1	
1903.....	Mar. 20	Apr. 11	23			
	Aug. 30	Oct. 3	35	0.08 0.27 0.12	Sept. 12 Sept. 16 Sept. 28	0.47
1904.....	Nov. 6	Dec. 7	32			
	Aug. 27	Sept. 19	24	0.07	Sept. 2	
	Sept. 26	Nov. 1	37	0.12 0.05	Oct. 6 Oct. 10	0.17
1905.....	May 29	June 13	16			
1906.....	May 17	May 31	15			
	June 3	June 18	16			
	Aug. 11	Sept. 3	24	0.05	Aug. 27	
	Sept. 8	Sept. 24	17	0.02	Sept. 22	
	Oct. 19	Nov. 16	29			
1907.....	Feb. 3	Feb. 25	23			
	July 13	July 29	17			
1908.....	June 18	July 19	32	0.26 0.10 0.35	June 30 July 8 Oct. 17	0.36 0.35 0.00
1909.....	Sept. 29	Nov. 22	55			
	June 25	July 15	21			
1910.....	No drought.					
1911.....	Sept. 10	Oct. 8	29			
1912.....	May 16	June 1	17			
	Sept. 22	Oct. 11	20			
1913.....	May 24	June 7	15			
	Oct. 30	Nov. 27	29			
1913.....	Dec. 30	Jan. 23	25	0.01	Jan. 18	
1914.....	May 9	June 14	37	0.13 0.04 0.05 0.17	May 18 May 27 May 29 June 4	0.39 0.00 0.00 0.07
	June 18	July 2	15			
	Aug. 28	Sept. 18	22	0.61	Nov. 9	
	Oct. 22	Nov. 26	36	0.06	Nov. 13	
1915.....	May 31	June 14	15			
	July 6	July 30	25			
	Aug. 28	Sept. 19	23			
	Sept. 22	Oct. 12	21			
	Oct. 20	Nov. 8	20			
1916.....	June 7	June 22	16			
	Aug. 15	Sept. 1	18			
	Oct. 20	Nov. 8	20			
1917.....	June 29	July 15	17	0.01	July 6	
1918.....	No drought.					

TABLE I—Continued

## Camden—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1919.....	No drought.					
1920.....	do.					
1921.....	May 15	June 3	20			
	Oct. 4	Nov. 15	43	0.17 0.02 0.05 0.01	Oct. 26 Oct. 31 Nov. 9 Nov. 14	0.00 0.25 0.00 0.01 0.00
1922.....	June 12	June 26	15			
	Aug. 15	Sept. 6	23	0.01	Aug. 27	
	Sept. 17	Oct. 5	19			
	Oct. 9	Nov. 5	28	0.01 0.01	Oct. 16 Nov. 1	0.02
1923.....	June 18	July 12	25	0.05 0.06	June 23 July 10	0.11 0.00
1924.....	Aug. 1	Aug. 23	23			
	July 13	Aug. 16	35	0.32 0.07	Aug. 12 Oct. 31	0.32 0.07
	Sept. 29	Nov. 7	40			
1925.....	May 12	June 30	50	0.28 0.01 0.04 0.31 0.05 0.09 0.45 0.17 0.29	May 24 June 8 June 9 June 10 June 13 June 25 Aug. 14 Aug. 15 Sept. 12	0.78 0.91 0.00 0.00 0.00 0.01 0.28
1926.....	May 15	May 31	17			
1927.....	Aug. 11	Aug. 27	17			
	Sept. 3	Sept. 18	16			
1928.....	July 31	Aug. 24	25	0.01	Aug. 20	
	Sept. 2	Oct. 2	31	0.01	Sept. 16	
1929.....	May 31	July 9	40	0.01 0.01 0.04 0.02 0.13 0.71 0.01 0.81 0.09 0.40 0.07 0.10 0.02 0.05 0.06	June 22 June 25 July 3 July 5 July 6 Sept. 7 Sept. 9 Sept. 13 Oct. 4 Oct. 5 Oct. 14 Oct. 15 Oct. 21 June 16 July 10	0.21 0.00 0.00 0.01 0.21 0.00 0.00 0.01 0.01 0.00 0.00 0.00 0.00 0.00 0.00 0.00
1930.....	June 7	Aug. 15	70			

## Calico Rock

[Calico Rock, 1905-1930; Dodd City, 1903-1904; Oregon, August to December, inclusive 1902; Keesee's Ferry, 1897-July, inclusive, 1902]

1897.....	May 10	May 26	17	<i>Inches</i>		<i>Inches</i>
	Aug. 11	Oct. 30	81	0.01 0.36 0.05	Aug. 14 Oct. 10 Oct. 11	0.00 0.42
1898.....	No drought.					
1899.....	July 31	Oct. 9	71	0.09 0.04 0.60 0.09 0.11 0.05	Aug. 4 Aug. 26 Aug. 27 Sept. 8 Sept. 17 Sept. 23	0.98 0.00 0.00 0.08 1.26 1.00
1900.....	July 30	Aug. 21	23			
1901.....	Feb. 12	Mar. 7	24			
	Apr. 19	May 15	27	0.05 0.03 0.28 0.04 0.02 0.04 0.64 0.24 0.32 0.45 0.10 0.13	Apr. 25 May 5 June 6 June 8 June 9 June 13 June 27 July 5 Sept. 11 Oct. 8 Oct. 12 Oct. 26	0.08 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
	May 20	July 25	67			
	Aug. 27	Nov. 2	68			
1901.....	Dec. 18	Jan. 19	33			
1902.....	July 1	July 18	18			
1903.....	Dec. 25	Jan. 20	27			
1904.....	May 18	June 2	16			
	Aug. 2	Aug. 16	15			
	Aug. 18	Sept. 1	15			
	Sept. 3	Sept. 23	21			
	Sept. 25	Nov. 30	67	0.60 0.10 0.10 0.10	Oct. 25 Nov. 2 Nov. 9 Nov. 10	0.80 0.00 0.10 0.15 0.00 0.00 0.00 0.00
1905.....	May 31	June 20	21			
	Sept. 20	Oct. 16	27	0.10	Oct. 3	
1906.....	May 6	May 31	26	0.15	May 25	
	June 27	July 11	15			
	July 23	Aug. 6	15			
	Oct. 19	Nov. 10	23			

TABLE I—Continued

## Calico Rock—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				Inches		Inches
1907	July 13	Aug. 17	36			0.00
1908	Sept. 11	Oct. 3	23			0.00
	June 6	July 25	50	0.01	June 10	
				0.01	June 14	
				0.04	June 29	
				0.01	July 3	
				0.08	July 18	
				0.06	July 20	0.21
				0.04	Sept. 5	0.04
1908	Aug. 24	Sept. 20	28			
1908	Sept. 28	Oct. 23	26			0.00
1909	Dec. 1	Jan. 11	42	0.30	Dec. 30	
				0.20	Jan. 5	0.50
	Mar. 10	Apr. 12	34	0.24	Apr. 6	0.24
	July 10	July 27	18			0.00
	Aug. 17	Sept. 4	19			0.00
	Sept. 23	Oct. 19	27	0.08	Oct. 9	
				0.12	Oct. 10	0.20
1910	Jan. 21	Feb. 16	27			T.
	Mar. 11	Apr. 2	23			0.00
	Apr. 18	May 5	18			0.00
	Sept. 7	Sept. 25	19			0.00
	Oct. 14	Dec. 22	71	0.08	Nov. 4	
				0.10	Nov. 5	
				0.30	Dec. 6	0.48
1911	Mar. 2	Mar. 25	24			0.00
	Apr. 28	May 18	21			0.00
	May 22	June 22	32			0.00
1912	Jan. 20	Feb. 8	20			0.00
	Apr. 28	June 12	46	0.10	May 11	
				0.40	May 29	0.50
	July 4	Aug. 8	36			0.00
	Aug. 18	Sept. 16	30			0.00
	Sept. 22	Oct. 31	40	0.20	Oct. 12	
				0.25	Oct. 18	
				0.20	Oct. 22	0.65
1912	Nov. 7	Jan. 5	60	0.30	Dec. 23	
1913				0.10	Dec. 24	
				0.20	Dec. 29	0.60
	May 7	July 9	64	0.52	June 22	0.52
	July 27	Aug. 10	15			0.00
	Aug. 12	Sept. 11	31			0.00
1913	Dec. 26	Jan. 23	29			0.00
1914	May 13	Aug. 11	91	0.15	June 17	
				0.20	July 2	
				0.70	July 4	
				0.95	July 13	2.00
1915	Sept. 24	Oct. 9	16			0.00
	May 30	June 13	15			0.00
	July 14	Aug. 3	21			0.00
	Aug. 28	Sept. 27	31	0.25	Sept. 18	0.25
	Oct. 19	Nov. 11	24			0.00
1916	June 20	July 30	41	0.45	July 18	
				0.40	July 21	0.85
1917	Aug. 15	Sept. 1	18			0.00
	Jan. 16	Feb. 14	30			0.00
	May 5	May 21	17			0.00
	Sept. 10	Sept. 26	17			0.00
	Oct. 31	Nov. 27	28			0.00
1918	Feb. 13	Apr. 3	50	0.14	Mar. 1	
				0.10	Mar. 22	0.24
	July 1	July 16	16			0.00
	Aug. 18	Sept. 11	25	0.03	Aug. 23	0.03
1918	Dec. 8	Jan. 6	30	0.01	Dec. 23	0.01
1919	Jan. 24	Feb. 28	36	0.19	Feb. 10	
1920	May 12	June 2	22	0.14	Feb. 14	0.33
1921	Sept. 21	Oct. 6	16	0.01	May 29	0.01
1922	June 29	July 13	15			0.00
1923	Sept. 23	Nov. 11	50	0.06	Sept. 28	
				0.15	Oct. 6	
				0.07	Oct. 31	0.28
				0.01	Sept. 1	0.01
1925	Aug. 22	Sept. 11	21			
1926	No drought.					
1927	Sept. 4	Sept. 26	23			0.00
1928	Sept. 16	Oct. 1	16			0.00
1929	July 12	Oct. 3	84	0.02	Aug. 7	
				0.23	Aug. 9	
				0.52	Aug. 10	
				0.05	Aug. 12	
				0.02	Sept. 6	
				0.21	Sept. 7	
				0.04	Sept. 12	
				0.78	Sept. 13	
				0.06	Sept. 21	
				0.46	July 25	1.93
				0.02	July 31	
				0.04	Aug. 5	
				0.08	Aug. 11	0.60

TABLE I—Continued

## Dardanelle

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				Inches		Inches
1897	May 11	May 28	18			0.00
	June 8	June 25	18			0.00
	June 27	July 17	21			0.00
	July 22	Aug. 8	18			0.00
	Aug. 16	Dec. 18	125	0.40	Sept. 16	
				0.39	Oct. 11	
				0.10	Oct. 31	
				0.28	Nov. 4	
				0.48	Nov. 15	
				0.10	Nov. 24	
				0.15	Dec. 1	
				0.10	Dec. 2	
				0.35	Dec. 17	2.35
				0.14	Aug. 19	
				0.10	Sept. 7	0.24
				0.05	Jan. 31	0.05
				0.10	Aug. 14	1.01
				0.91	Aug. 28	0.00
1898	Aug. 10	Sept. 10	32			0.00
1899	Jan. 14	Feb. 24	42			0.00
	July 23	Oct. 9	79			0.00
				0.10	Aug. 28	1.01
1900	Oct. 29	Nov. 18	21			0.00
	July 22	Aug. 22	32			0.00
	Nov. 2	Nov. 22	21			0.00
	Nov. 25	Dec. 18	24			0.00
1901	Feb. 12	Mar. 8	25			0.00
	Apr. 19	July 30	103	0.05	May 13	
				0.18	May 20	
				0.15	May 25	
				0.05	May 31	
				1.15	June 8	
				0.15	June 12	
				0.08	June 19	
				0.20	June 26	
				0.10	June 29	
				0.13	July 1	
				0.52	July 14	
				0.62	July 26	3.38
1901	Aug. 12	Sept. 11	31			0.00
1902	Dec. 15	Jan. 17	34			0.00
	Jan. 28	Feb. 18	22			0.00
	June 1	June 16	16			0.00
	June 30	July 14	15			0.00
	Aug. 12	Sept. 5	25			0.00
	Oct. 5	Oct. 26	22			0.00
	Jan. 6	Jan. 26	21			0.00
1903	June 2	July 23	52	0.20	June 26	
				0.10	June 27	
				0.08	July 4	
				0.20	July 11	
				0.26	July 12	
				0.28	July 13	1.12
	Aug. 30	Sept. 13	15			0.00
	Oct. 7	Dec. 11	66	0.01	Oct. 29	
				0.04	Oct. 30	
				0.08	Oct. 31	
				0.12	Nov. 1	
				0.06	Nov. 5	
				0.24	Dec. 1	0.55
1903	Dec. 25	Jan. 20	27			0.00
1904	Jan. 24	Feb. 17	25			0.00
	Aug. 27	Sept. 18	23			0.00
	Oct. 7	Dec. 22	77	0.10	Nov. 3	
				0.08	Nov. 4	
				0.04	Nov. 21	
				0.01	Dec. 3	
				0.20	Dec. 4	
				0.10	Dec. 14	0.53
1905	Aug. 20	Sept. 6	18			0.00
1906	May 8	May 22	15			0.00
	Oct. 17	Nov. 16	31			0.00
1907	Feb. 1	Feb. 23	23			0.00
	July 1	Aug. 17	48	0.16	July 11	
				0.26	Aug. 5	0.42
	Aug. 25	Sept. 8	15			0.00
	Oct. 8	Nov. 17	41	0.04	Oct. 30	0.04
1908	June 18	Aug. 3	47	0.12	July 3	
				0.08	July 7	
				0.52	July 14	
				0.20	July 20	
				0.32	July 25	
					July 28	1.36
	Aug. 21	Sept. 4	15			0.00
	Sept. 29	Nov. 1	34			0.00
	Dec. 1	Dec. 29	29			0.00
	July 16	Aug. 6	22			0.00
	Aug. 9	Sept. 4	27			0.00
	Sept. 23	Oct. 8	16			0.00
	Jan. 19	Feb. 16	29			0.00
1910	May 2	May 19	18			0.00
1911	Nov. 7	Dec. 22	46	0.04	Nov. 27	
				0.04	Dec. 2	0.08
1912	Aug. 1	Sept. 7	38	0.02	Aug. 11	
				0.04	Aug. 12	
				0.14	Aug. 21	2.20

TABLE I—Continued

## Dardanelle—Continued

Year	Begin- ning—	Ending—	Number of days	Precipitation	Date	Total
				Inches		Inches
1913.....	Dec. 29	Jan. 29	32	0.10	Jan. 24	0.10
1914.....	May 14	July 1	49	0.02	May 17	
				0.18	May 28	
				0.33	June 16	
				0.10	June 17	0.63
	July 9	July 31	23	0.05	July 18	0.05
	Sept. 5	Oct. 8	34	0.18	Sept. 20	
				0.20	Sept. 23	0.38
	Oct. 22	Nov. 26	36	0.04	Nov. 8	0.04
1915.....	June 30	July 31	32	0.12	July 3	
				0.08	July 9	
				0.12	July 19	0.32
1916.....	Oct. 18	Nov. 10	24			0.00
	Feb. 1	Feb. 22	22			0.00
	Mar. 3	Mar. 24	22			0.00
1917.....	Jan. 23	Feb. 14	23			0.00
	May 5	May 20	16			0.00
	Sept. 28	Oct. 18	21			0.00
1918.....	Mar. 5	Apr. 3	30			0.00
	June 10	June 28	19			0.00
	July 24	Aug. 7	15			0.00
1919.....	July 10	Aug. 14	26	0.12	Aug. 1	0.12
	Aug. 31	Sept. 19	20			0.00
1919.....	Dec. 8	Jan. 5	29			0.00
1920.....	Jan. 24	Mar. 3	40	0.02	Feb. 11	
				0.18	Feb. 14	
				0.02	Feb. 15	
				0.35	Feb. 29	0.55
	Aug. 10	Aug. 25	16			0.00
	Sept. 14	Oct. 13	30			0.00
	Nov. 11	Dec. 5	25	0.01	Nov. 30	0.06
1921.....	May 12	May 27	16	0.05	Dec. 3	0.00
	Aug. 15	Aug. 31	17			0.00
	Sept. 26	Nov. 15	51	0.38	Oct. 29	0.63
1922.....	May 23	June 7	16	0.25	Nov. 9	0.00
	June 11	June 26	16			0.00
	Aug. 28	Oct. 5	39	0.61	Sept. 11	0.82
				0.21	Sept. 20	0.00
1923.....	Oct. 8	Oct. 31	24			0.00
	June 29	July 13	13			0.00
	Sept. 21	Oct. 15	25			0.00
1924.....	May 1	May 20	20			0.00
	Aug. 17	Sept. 1	16			0.00
	Oct. 7	Nov. 11	36			0.00
1925.....	May 15	June 7	24			0.00
	June 9	July 5	27			0.00
	Aug. 10	Sept. 11	33			0.00
1926.....	Dec. 15					0.00
	Jan. 23	Feb. 17	26			0.00
	May 12	June 3	23			0.00
	June 17	July 7	21			0.00
	July 28	Aug. 11	15			0.00
	Aug. 25	Sept. 22	29			0.00
1927.....	No drought.					
1928.....	Aug. 26	Oct. 4	40	0.44	Sept. 11	0.44
1929.....	July 9	Sept. 4	58	0.03	July 27	
				0.10	July 30	
				0.39	July 31	
				0.10	Aug. 10	
				0.06	Aug. 13	
				0.13	Aug. 22	0.81
1930.....	June 18	Aug. 3	47	0.02	June 24	
				0.10	July 24	
				0.10	July 31	0.22

## Fort Smith

Year	Begin- ning—	Ending—	Number of days	Precipitation	Date	Total
1897.....	May 12	May 26	15			0.00
	Aug. 15	Sept. 8	25	0.04	Aug. 30	0.04
1898.....	Sept. 17	Oct. 9	23			0.00
1899.....	No drought.					
	July 21	Oct. 15	84	1.15	Aug. 14	
				0.03	Sept. 10	
				0.31	Sept. 17	
1900.....	July 25	Aug. 24	31	0.01	Oct. 10	1.50
	Nov. 25	Dec. 18	24	0.03	Aug. 22	0.03
				0.01	Dec. 3	
1901.....	Feb. 12	Mar. 7	24	0.02	Feb. 22	0.03
	June 20	July 4	15	0.02		0.02
	Aug. 12	Oct. 3	53	0.01	Aug. 27	0.00
				0.12	Sept. 1	
				0.03	Sept. 11	
				0.01	Sept. 12	
				0.01	Sept. 13	
				0.25	Sept. 14	0.43
1902.....	May 31	June 16	17	0.01	July 4	0.00
	July 1	July 24	24	0.21	July 12	
				0.08	July 20	0.30
	Aug. 12	Aug. 31	20			0.00

TABLE I—Continued

## Fort Smith—Continued

Year	Begin- ning—	Ending—	Number of days	Precipitation	Date	Total
				Inches		Inches
1903.....	Mar. 29	May 5	38	0.16	Apr. 7	
				0.08	Apr. 10	
				0.01	Apr. 12	
				0.01	Apr. 13	
				0.08	Apr. 18	
				0.02	Apr. 29	0.36
	June 4	June 18	15			0.00
	July 5	July 31	27	0.01	July 15	
				0.11	July 29	
				0.07	July 30	0.19
	Aug. 30	Sept. 15	17	0.18	Sept. 10	
				0.01	Sept. 14	0.19
				0.10	Dec. 1	0.10
1903.....	Dec. 25	Jan. 19	26	0.03	Jan. 16	0.03
1904.....						
1904.....	Oct. 5	Jan. 7	95	0.44	Oct. 25	
1905.....				0.18	Nov. 3	
				0.06	Nov. 11	
				0.02	Nov. 20	
				0.02	Dec. 3	
				0.20	Dec. 5	
				0.01	Dec. 6	
				0.10	Dec. 14	
				0.01	Dec. 16	
				0.11	Dec. 23	
				0.03	Dec. 26	1.25
				0.07	Dec. 27	0.00
1906.....	Oct. 19	Nov. 9	22			0.00
1907.....	Feb. 1	Feb. 22	22			0.00
	July 14	Sept. 1	50	0.17	July 28	
				0.29	Aug. 4	
				0.08	Aug. 12	
				0.13	Aug. 22	
				0.02	Aug. 30	0.69
1908.....	Oct. 8	Oct. 28	21			0.00
1908.....	Sept. 28	Oct. 18	21			0.00
1909.....	Nov. 30	Feb. 4	67	0.09	Dec. 29	
				0.06	Jan. 4	
				0.42	Jan. 11	
				0.05	Jan. 12	
				0.04	Jan. 15	
				0.02	Jan. 21	
				0.02	Jan. 25	
				0.01	Jan. 27	0.71
	July 16	Oct. 7	84	0.03	July 22	
				0.01	Aug. 8	
				0.05	Aug. 13	
				0.76	Aug. 24	
				0.01	Sept. 1	
				0.31	Sept. 5	
				0.02	Sept. 6	
				0.03	Sept. 14	
				0.01	Sept. 21	1.23
1910.....	July 13	Aug. 3	22	0.01	July 23	
				0.01	July 30	
				0.05	July 31	0.07
1910.....	Oct. 21	Feb. 9	112	0.05	Oct. 26	
1911.....				0.03	Oct. 27	
				0.35	Nov. 15	
				0.09	Nov. 26	
				0.01	Nov. 27	
				0.04	Dec. 4	
				0.06	Dec. 22	
				0.18	Dec. 27	
				0.09	Dec. 28	
				0.22	Dec. 29	
				0.10	Jan. 17	
				0.18	Jan. 18	
				0.12	Jan. 28	1.52
	May 21	July 7	48	0.21	June 17	
				0.02	June 18	
				0.01	June 22	
				0.01	June 25	
				0.20	June 29	0.45
1912.....	Jan. 19	Feb. 19	32	0.02	Feb. 9	
	Aug. 16	Oct. 29	75	0.09	Feb. 17	0.11
				0.01	Aug. 25	
				0.07	Sept. 11	
				0.34	Sept. 17	
				0.70	Sept. 20	
				0.74	Sept. 21	
				0.03	Sept. 24	
				0.06	Oct. 11	
				0.09	Oct. 17	
				0.12	Oct. 21	2.16
1912.....	Nov. 7	Jan. 5	60	0.05	Nov. 27	
1913.....				0.13	Dec. 1	
				0.04	Dec. 3	
				0.11	Dec. 22	
				0.21	Dec. 23	0.54
	Aug. 2	Sept. 7	37	0.02	Aug. 12	0.02
1913.....	Dec. 29	Jan. 28	31	0.03	Jan. 25	0.03
1914.....	June 1	July 1	31	0.05	June 11	
				0.32	June 16	
				0.01	June 29	0.38
	Oct. 21	Nov. 26	37	0.10	Nov. 9	0.10

TABLE I—Continued

## Fort Smith—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1915.....	Aug. 29	Sept. 18	21	0.01	Sept. 16	0.01
	Oct. 18	Nov. 10	24			0.00
1916.....	Mar. 2	Mar. 24	23	0.01	Mar. 23	0.01
	July 1	Aug. 30	61	0.13	July 18	
				0.18	July 19	
				0.03	July 20	
				0.09	Aug. 8	
				0.03	Aug. 13	
				0.02	Aug. 14	
				0.10	Aug. 27	0.51
1917.....	June 9	June 30	22	0.07	June 21	
	Sept. 28	Nov. 25	59	0.03	June 24	0.17
				0.01	Oct. 7	
				0.09	Oct. 17	
				0.07	Oct. 27	
				0.20	Oct. 28	
				0.06	Nov. 10	
				0.47	Nov. 17	
				0.07	Nov. 18	
				0.07	Nov. 19	1.00
1917.....	Nov. 29	Jan. 5	38	0.36	Dec. 7	0.36
1918.....	Mar. 4	Mar. 27	24			0.00
	June 9	June 26	18			0.00
	July 12	Aug. 28	48	0.02	July 17	
				0.02	July 18	
				0.07	Aug. 7	
				0.01	Aug. 16	
				0.15	Aug. 23	
				0.03	Aug. 24	0.30
1919.....	July 3	Aug. 2	31	0.07	July 27	0.07
	Aug. 30	Oct. 3	35	0.01	Sept. 11	
				0.08	Sept. 18	
				0.43	Sept. 19	
				0.02	Sept. 21	
				0.02	Sept. 22	0.56
1919.....	Dec. 7	Jan. 4	29			0.00
1920.....	Sept. 26	Nov. 15	51	0.01	Sept. 29	
1921.....				0.06	Oct. 28	
				0.03	Oct. 29	
				0.01	Oct. 30	
				0.07	Nov. 8	
				0.01	Nov. 9	0.22
				0.01	July 26	0.01
1922.....	July 13	Aug. 2	21			0.00
	Sept. 11	Oct. 5	25			
1923.....	June 16	July 12	27	0.01	June 19	
				0.01	June 28	0.02
	July 21	Aug. 31	42	0.02	July 25	
				0.01	July 26	
				0.02	July 30	
				0.04	Aug. 8	
				0.07	Aug. 21	
				0.18	Aug. 22	0.34
1924.....	Apr. 30	May 22	23	0.03	May 6	
				0.03	May 7	
				0.01	May 13	0.07
	Aug. 11	Sept. 11	32	0.01	Aug. 18	
				0.31	Aug. 31	
				0.09	Sept. 1	0.44
	Oct. 10	Nov. 13	35	0.02	Oct. 30	
				0.05	Nov. 7	
				0.03	Nov. 9	
				0.06	Nov. 11	0.16
1925.....	Feb. 26	Mar. 28	31	0.03	Mar. 9	
				0.04	Mar. 10	
				0.07	Mar. 13	0.14
				0.12	Aug. 20	0.12
1926.....	Aug. 10	Sept. 9	31			0.00
	July 27	Aug. 14	19			0.00
	Sept. 10	Sept. 24	15			0.00
1927.....	June 21	July 12	22	0.03	June 30	0.03
	Aug. 30	Sept. 22	24			0.00
1928.....	Aug. 31	Oct. 2	33	0.05	Sept. 10	0.05
1929.....	July 10	Sept. 3	56	0.08	Aug. 12	
				0.04	Aug. 25	0.12
	Sept. 13	Oct. 9	27	0.06	Oct. 4	0.05
1930.....	July 4	Sept. 7	66	0.36	July 30	
				0.09	Aug. 11	
				0.01	Aug. 15	
				0.04	Aug. 30	
				0.84	Aug. 31	1.39

## Fulton

[Fulton, 1897-June, inclusive, 1898; February, inclusive, 1905-1930; Washington, July 1898-January 1904, inclusive; Hope, February 1904-January 1905, inclusive]

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1897.....	June 8	Oct. 11	126	0.03	June 15	
				0.23	July 19	
				0.57	July 27	
				0.60	July 29	
				0.15	Aug. 10	
				0.21	Aug. 31	
				0.15	Sept. 9	
				0.40	Sept. 10	
				0.49	Sept. 14	
				0.25	Sept. 17	3.11

TABLE I—Continued

## Fulton—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1898.....	Feb. 19	Mar. 11	21			0.00
	July 8	July 24	17			0.00
1899.....	July 24	Oct. 9	78	0.09	Aug. 14	
				0.10	Aug. 17	
				0.54	Aug. 27	
				0.10	Sept. 6	
				0.04	Sept. 8	
				0.19	Sept. 10	
				0.22	Sept. 11	
				0.04	Sept. 17	
				0.07	Sept. 18	1.39
1900.....	Aug. 1	Aug. 25	25	0.06	Aug. 6	
				0.02	Aug. 19	0.08
				0.04	Sept. 9	0.04
1901.....	Aug. 31	Sept. 19	20			0.00
	Apr. 19	May 11	23			0.00
	Sept. 15	Oct. 7	23			0.00
1901.....	Dec. 15	Jan. 3	20			0.00
1902.....	June 30	July 14	15			0.00
	Aug. 1	Aug. 31	31	0.03	Aug. 6	
				0.02	Aug. 8	
				0.03	Aug. 27	0.08
1903.....	Mar. 28	May 4	38	0.03	Apr. 11	
				0.43	Apr. 29	0.46
				0.01	Oct. 29	
				0.01	Nov. 4	
				0.02	Nov. 5	
				0.02	Nov. 25	
				0.10	Dec. 4	0.16
1904.....	Aug. 8	Aug. 25	18			0.00
	Sept. 5	Sept. 19	15			0.00
	Sept. 23	Nov. 1	40	0.39	Oct. 5	
				0.16	Oct. 11	0.55
1905.....	No drought.					
1906.....	June 26	July 10	15			0.00
	Sept. 17	Oct. 4	18			0.00
	Oct. 15	Nov. 15	32	0.20	Nov. 7	0.20
1907.....	Feb. 2	Feb. 24	23			0.00
	June 5	June 29	16			0.00
	July 12	Aug. 21	41			0.00
	Sept. 10	Oct. 2	23			0.00
	Jan. 11	Jan. 30	20			0.00
1908.....	June 17	July 7	21			0.00
	Aug. 18	Sept. 13	27			0.00
	Sept. 29	Nov. 1	34			0.00
1909.....	July 18	Aug. 6	20			0.00
	Aug. 8	Aug. 24	17			0.00
	Sept. 6	Sept. 20	15			0.00
1910.....	July 3	Aug. 4	33			0.00
	Aug. 22	Sept. 5	15			0.00
	Sept. 7	Oct. 4	28	0.12	Sept. 28	
	Oct. 22	Dec. 11	51	0.12	Nov. 10	0.12
			51	0.08	Nov. 16	
				0.20	Nov. 28	0.40
1911.....	Jan. 4	Jan. 23	20			0.00
	May 22	June 21	31			0.00
	Aug. 30	Oct. 15	47	0.28	Sept. 13	
				0.25	Sept. 21	
				0.18	Oct. 5	0.71
1912.....	July 3	July 30	28	0.16	July 20	0.16
	Aug. 28	Sept. 17	21			0.00
	Sept. 22	Oct. 17	26			0.00
	Nov. 7	Dec. 1	25			0.00
1913.....	May 23	June 7	16			0.00
	Oct. 28	Nov. 22	26			0.00
1914.....	Dec. 29	Jan. 29	32			0.00
	May 29	Aug. 1	65	0.66	June 17	
				0.43	July 7	
				0.07	July 8	
				0.66	July 9	1.82
				0.41	Sept. 24	
				0.04	Oct. 1	0.45
1915.....	Aug. 27	Nov. 26	92			0.00
	July 10	July 31	22			1.15
	Aug. 29	Oct. 12	45	1.15	Sept. 21	
	Oct. 19	Nov. 7	20			0.00
1916.....	Mar. 2	Mar. 24	23			0.00
	June 27	July 15	19			0.00
	Aug. 11	Oct. 13	64	0.18	Aug. 23	
				0.05	Sept. 3	
				0.43	Sept. 9	
				0.18	Sept. 12	
				0.04	Sept. 23	0.88
1917.....	Oct. 20	Nov. 8	20			0.00
	June 28	July 14	17	0.00	July 6	0.01
	Sept. 18	Oct. 7	20			0.00
	Oct. 28	Nov. 18	22			0.00
1918.....	July 14	Aug. 6	24	0.05	July 29	
				0.15	July 30	0.20
1919.....	June 4	June 19	16			0.00
	July 3	Aug. 8	37			0.00
	Aug. 31	Sept. 20	21			0.00
1920.....	July 21	Aug. 9	20	0.07	July 29	0.07
	Sept. 24	Oct. 14	21			0.00
1921.....	May 16	June 7	23			0.00
	July 22	Aug. 8	18			0.00
	Sept. 10	Sept. 25	16			0.00
	Oct. 4	Nov. 15	43	0.08	Oct. 31	0.08
1922.....	June 12	June 26	15			0.00
	July 4	Aug. 2	30	0.36	July 26	0.36
	Aug. 26	Oct. 6	42	0.05	Sept. 7	
				0.16	Sept. 11	0.21
1923.....	Aug. 1	Aug. 18	18			0.00

TABLE I—Continued

## Fulton—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1924.....	June 23	Sept. 11	81	0.15 0.38 0.11 0.08 0.47 0.04 0.06	July 10 Aug. 7 Aug. 18 Aug. 25 Sept. 2 Sept. 28 Oct. 31	1.20
	Sept. 23	Nov. 7	46			0.10
1925.....	May 25	June 8	15			0.00
1926.....	Aug. 16	Sept. 11	27			0.00
	May 16	May 31	16			0.00
	Sept. 8	Sept. 22	15			0.00
	Nov. 16	Dec. 6	21			0.00
1927.....	Aug. 11	Aug. 28	18			0.00
1928.....	Sept. 4	Sept. 18	15			0.00
	Aug. 6	Oct. 1	57	0.34 0.12 0.25 0.10 0.12 0.15	Aug. 26 Aug. 31 Sept. 11 Aug. 13 Sept. 6 Sept. 9	0.71
1929.....	Aug. 3	Sept. 12	41			0.37
	Sept. 14	Oct. 3	20			0.00
1930.....	May 24	Sept. 9	109	0.21 0.02 0.02 0.02 0.09 0.40 0.95	June 6 July 5 July 10 Aug. 12 Aug. 19 Aug. 31	1.69

## Helena

1897.....	May 14	June 2	20			0.00
	Aug. 21	Oct. 25	69	0.45 0.06	Oct. 11 Oct. 12	0.51
1898.....	No drought.					
1899.....	Aug. 29	Nov. 19	83	0.01 0.10 0.37 0.06 0.25 0.05 0.38 0.02 0.07 0.08 0.01 0.02 0.30 0.26 0.10 0.50	Sept. 12 Sept. 15 Sept. 19 Oct. 11 Oct. 12 Oct. 17 Oct. 28 Oct. 29 Nov. 2 Nov. 14 Aug. 1 June 25 July 18 July 31 Aug. 5 Aug. 6	1.39 0.01
1900.....	July 31	Aug. 20	21			0.00
1901.....	June 8	Aug. 10	64			0.00
	Aug. 28	Sept. 11	15			0.00
	Sept. 18	Oct. 8	21			0.00
	Oct. 14	Nov. 2	20			0.00
1901.....	Dec. 29	Jan. 19	23			0.00
1902.....	June 29	July 27	29	0.40	July 21	0.40
	Aug. 3	Sept. 10	39	0.52 0.22	Aug. 28 Sept. 2	0.74
1903.....	June 2	June 21	20			0.00
	Sept. 18	Dec. 8	82	0.13 0.11 0.08 0.59 0.09 0.10 0.12 0.04	Oct. 6 Oct. 14 Nov. 2 Nov. 5 Nov. 12 Nov. 17 Dec. 2 Sept. 3	1.22 0.04 0.00
1904.....	Aug. 27	Sept. 19	24			0.00
	Oct. 12	Nov. 2	22			0.00
1905.....	No drought.					
1906.....	Oct. 19	Nov. 13	26	0.02	Nov. 8	0.02
1907.....	July 13	July 27	15			0.00
1908.....	June 15	June 29	15			0.00
	Aug. 25	Sept. 25	32	0.08 0.02 0.12 0.08 0.10 0.10 0.06	Sept. 5 Sept. 22 Oct. 24 Aug. 6 Aug. 8 Aug. 12 Sept. 5 Sept. 14	0.10 0.12
1909.....	Sept. 29	Nov. 10	43			0.50
	July 24	Sept. 20	59			0.00
	Sept. 24	Oct. 16	23			0.04
1910.....	July 19	Aug. 7	20	0.01 0.16 0.08 0.40	Aug. 4 Sept. 3 Sept. 6 Sept. 22	0.64
	Aug. 22	Oct. 3	43			0.00
1911.....	Nov. 7	Nov. 26	20			0.32
	May 2	June 18	48	0.20 0.12 0.22 0.20 0.14	May 19 May 21 Sept. 11 Sept. 21 Sept. 22	0.56 0.00 0.00 0.00 0.00
	Aug. 28	Sept. 30	34			0.08
1912.....	Aug. 29	Sept. 14	17			0.00
	Sept. 28	Oct. 17	20			0.00
1913.....	June 8	June 28	21			0.00
	Oct. 30	Nov. 28	30	0.08	Nov. 17	0.08
1913.....	Dec. 30	Jan. 18	20			0.00

TABLE I—Continued

## Helena—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1914.....	May 6	Aug. 2	89	0.05 0.15 1.04 0.12 0.01 0.05 0.23 0.16	May 11 May 31 June 16 July 6 July 15 July 18 July 19 July 30	1.81 0.00 0.00 0.00 0.00 0.00 0.00 0.00
1915.....	July 10	Aug. 2	24			0.00
	Aug. 30	Sept. 20	22			0.00
	Oct. 20	Nov. 11	23			0.00
1916.....	May 4	May 20	17			0.00
	Sept. 25	Oct. 17	23			0.00
1917.....	June 10	July 6	27			0.00
	Aug. 23	Sept. 15	24	0.03 0.45 0.08	Aug. 31 Oct. 8 Oct. 19	0.03 0.53
1917.....	Sept. 19	Oct. 25	37			0.05
1918.....	Dec. 9	Jan. 5	28	0.05	Dec. 31	0.00
	May 14	June 1	19			0.00
	June 8	Aug. 19	73	0.44 0.36 0.06 0.16 0.26 0.54 0.42	June 26 June 28 June 29 July 12 July 18 July 28 Aug. 12	2.24 0.00 0.00 0.20 0.06 0.06 0.00
1919.....	June 5	June 19	15			0.00
	July 9	July 27	19			0.00
	Aug. 25	Sept. 20	27	0.20	Sept. 8	0.20
1920.....	Sept. 24	Oct. 23	30	0.06	Oct. 16	0.06
1921.....	May 13	June 9	28	0.06	June 5	0.06
1922.....	July 27	Aug. 12	17			0.00
	Oct. 11	Oct. 31	21			0.00
1923.....	Sept. 9	Oct. 15	37	0.06 0.01 0.02 0.06 0.01 0.04 0.04 0.01 0.10 0.20 0.02 0.01 0.10 0.48	Sept. 20 Oct. 5 Oct. 6 Nov. 1 Apr. 14 Apr. 28 May 24 June 1 June 3 Sept. 12 Sept. 13 July 8 July 25 July 26 July 27	0.07 0.03 0.05 0.09 0.30 0.61 0.00 0.00
1924.....	Sept. 23	Nov. 7	46			0.34
1925.....	Apr. 6	May 9	34			0.00
	May 15	June 6	23			0.00
	Aug. 23	Sept. 23	32			0.00
1926.....	June 28	July 31	34			0.00
1927.....	Oct. 13	Nov. 1	20			0.00
1928.....	June 26	July 12	17			0.00
	Sept. 3	Oct. 15	43	0.02 0.14 0.18	Oct. 3 Oct. 4 Oct. 5	0.34 0.00
1929.....	Aug. 14	Sept. 5	23			0.00
1930.....	May 20	Aug. 30	103	0.06 0.33 0.42 0.06 0.53 0.50 0.03 0.08 0.02	June 6 July 1 July 20 July 21 July 24 Aug. 5 Aug. 14 Aug. 16 Aug. 17	2.03

## Little Rock

1879.....	Aug. 25	Nov. 7	75	0.39 0.05 0.03 0.01 0.31 0.58 0.03	Sept. 12 Oct. 1 Oct. 2 Oct. 3 Oct. 11 Oct. 17 Nov. 5	1.40 0.00 0.00 0.01 0.05
1880.....	Apr. 30	May 19	20			0.00
1881.....	July 1	July 18	18			0.00
	July 28	Aug. 28	32	0.01	Aug. 15	0.01
	Sept. 2	Sept. 27	26	0.05	Sept. 10	0.05
1882.....	No drought.					0.00
1883.....	Aug. 24	Sept. 14	22			0.00
1884.....	Sept. 30	Oct. 20	21			0.00
1885.....	No drought.					
1886.....	Aug. 7	Aug. 27	21	0.01 0.03 0.06 0.09 0.06 0.02 0.12 0.12 0.14 0.12 0.48 0.48 0.01 0.06	Aug. 11 Aug. 25 July 21 July 29 Aug. 2 Aug. 3 Aug. 5 Aug. 15 Aug. 17 Aug. 22 Aug. 25 Aug. 26 Sept. 15 Sept. 17 Sept. 22	0.04
1887.....	July 8	Nov. 22	138			



TABLE I—Continued

## Little Rock—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1887	July 8	Nov. 22		0.25 0.23 0.01 0.02 0.27 0.55 0.12 0.01 0.02	Sept. 26 Sept. 27 Sept. 29 Oct. 10 Oct. 22 Oct. 23 Oct. 24 Oct. 26 Sept. 6	
1888	Sept. 2	Sept. 20	19	0.02		3.34
1889	Aug. 16	Aug. 30	15			0.00
	Sept. 30	Oct. 28	29	0.12	Oct. 13	0.12
	Nov. 28	Dec. 30	33	0.02 0.02 0.06	Dec. 9 Dec. 10 Dec. 20	
1890	No drought.					0.10
1891	Sept. 4	Oct. 2	29	0.04	Sept. 16	0.04
	Oct. 5	Nov. 1	28	0.14	Oct. 14	0.14
1892	Sept. 13	Oct. 13	31	0.04	Oct. 8	0.04
1893	No drought.					
1894	May 31	July 1	32	0.02 0.03 0.02 0.19	June 5 June 6 June 10 June 20	
						0.26
	Nov. 3	Nov. 22	20			0.00
	Sept. 2	Oct. 6	35	0.05 0.04 0.16 0.01	Sept. 21 Sept. 23 Sept. 26 Oct. 4	
1895						0.26
						0.00
1896	June 6	June 20	15			
	July 16	Aug. 18	34	0.01 0.06 0.11 0.03 0.11 0.33 0.28 0.24 0.01 0.02 0.01 0.11 0.02 0.03 0.09 0.08 0.01 0.01	Aug. 9 Aug. 11 Aug. 16 July 10 Aug. 30 Sept. 13 Oct. 10 Oct. 11 Oct. 20 June 28 July 7 July 8 July 17 July 21 Aug. 4 Aug. 14 Oct. 10 Oct. 11 Oct. 12 May 16	
1897	June 28	July 16	19			0.18
	Aug. 11	Oct. 27	78			0.03
1898	June 22	July 24	33	0.02 0.01 0.11 0.01 0.02 0.03 0.09 0.08 0.01 0.01	June 28 July 7 July 8 July 17 July 21 Aug. 4 Aug. 14 Oct. 10 Oct. 11 Oct. 12 May 16	
1899	July 31	Aug. 25	26			0.17
	Sept. 19	Oct. 16	28			0.12
1900	May 9	May 26	18			0.18
1901	Apr. 26	May 10	15			0.01
	June 9	July 4	26			0.00
1901	Dec. 15	Jan. 3	20			0.00
1902	July 1	July 25	25			0.00
	Aug. 12	Aug. 31	20			0.00
1903	No drought.					
1904	Aug. 27	Sept. 18	23	0.16 0.01	Sept. 3 Sept. 4	
						0.17
						0.00
1905	Oct. 12	Nov. 1	21			
1906	No drought.					
	May 7	May 25	19	0.02	May 24	0.02
	Oct. 18	Nov. 6	20			0.00
1907	July 12	July 27	16			0.00
	Sept. 10	Oct. 3	24			0.00
	Oct. 8	Oct. 29	22	0.01 0.16 0.04 0.09 0.02 0.03 0.04	Oct. 26 Sept. 4 Sept. 6 Oct. 17 Aug. 24 Feb. 2 Feb. 11	
1908	Aug. 24	Sept. 19	27			0.01
						0.20
	Sept. 28	Oct. 22	25			0.09
1909	Aug. 13	Sept. 3	22			0.02
1910	Jan. 21	Feb. 15	26			0.07
						0.00
	Sept. 7	Sept. 26	20			
	Oct. 28	Dec. 21	55	0.01 0.04 0.04 0.03 0.04	Nov. 1 Nov. 15 Nov. 16 Dec. 5 Dec. 12	
1911	May 1	May 19	19			0.16
	May 22	June 16	26			0.00
1912	Aug. 27	Sept. 14	19			0.00
	Nov. 7	Nov. 30	24	0.01	Nov. 27	0.01
1913	Dec. 29	Jan. 22	25	0.05	Jan. 18	0.05
1914	May 13	June 30	49	0.01 0.01 0.08 0.03 0.00 0.00 0.03 0.12 0.32 0.12 0.05 0.01 0.15 0.05 0.06	May 16 June 15 Nov. 8 July 19 June 15 Nov. 1 Dec. 1 Mar. 14 May 21 May 29 July 3 July 6 July 7 July 12 July 21 July 28	
1915	Oct. 21	Nov. 25	36			0.44
	July 9	July 31	23			0.00
	Aug. 30	Sept. 19	21			0.00
	Oct. 19	Nov. 7	20			0.00
1916	Mar. 2	Mar. 24	23			0.03
	May 4	June 4	32			0.03
						0.44
						0.00
	June 30	July 31	32			
						0.44
						0.00
						0.00
						0.44
						0.00
1917	May 4	May 20	17			
	June 9	July 6	28	0.11 0.05 0.01	June 23 June 28 July 2	

TABLE I—Continued

## Little Rock—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1917	Sept. 4	Oct. 17	44	0.08 0.09 0.01 0.04 0.14	Sept. 15 Sept. 16 Sept. 17 Sept. 27 Oct. 8	
1918	No drought.					0.36
1919	July 11	July 27	17			0.00
	Aug. 26	Sept. 20	26	0.01	Sept. 7	0.01
1920	Sept. 24	Oct. 14	21			0.00
1921	May 12	June 5	25			0.00
	Oct. 3	Nov. 8	37	0.01 0.07 0.69 0.11 0.12 0.01 0.13 0.04 0.55 0.05 0.17 0.05 0.01	Oct. 28 Oct. 31 Sept. 10 Sept. 15 Sept. 16 Sept. 19 Oct. 6 Oct. 7 Oct. 16 Oct. 23 Nov. 1 June 28 July 9	
1922	Aug. 17	Nov. 4	80			0.08
1923	June 21	July 13	23			1.87
						0.06
						0.00
1924	Sept. 20	Oct. 15	26			0.06
	Sept. 28	Nov. 6	40	0.06	Oct. 31	0.06
1925	May 14	June 7	25			0.00
	Aug. 22	Sept. 10	20			0.00
1926	May 12	June 14	34	0.01 0.07 0.01 0.19 0.07	May 19 May 30 May 31 June 3 June 30	
1927	June 22	July 13	22			0.28
	Sept. 4	Sept. 25	22			0.07
1928	Sept. 16	Oct. 2	17			0.00
1929	Sept. 14	Oct. 2	19			0.00
1930	Mar. 25	May 1	38	0.03 0.06 0.06 0.02 0.02 0.08 0.04 0.01 0.08 0.19 0.13 0.03 0.13 0.09	Apr. 5 Apr. 23 Apr. 26 Apr. 27 May 29 June 4 June 30 July 1 Aug. 4 Aug. 16 Aug. 17 Aug. 18 Aug. 30 Aug. 31	
						0.80

## Mena

[Dallas, 1897-1905, inclusive; Mena, 1906-1930, inclusive]

1897	June 28	July 16	19			0.00
	Aug. 19	Sept. 8	21			0.00
	Sept. 17	Oct. 10	24			0.00
1898	Oct. 20	Nov. 8	20			0.00
1899	June 17	July 3	17			0.00
	Aug. 22	Sept. 16	26			0.00
	Sept. 18	Oct. 9	22			0.00
	Oct. 23	Nov. 17	21			0.00
1900	July 31	Aug. 20	21	0.10	Aug. 11	0.10
1901	Oct. 9	Nov. 1	24	0.02	Oct. 11	0.02
1902	Dec. 18	Jan. 17	31	0.10	Jan. 4	0.10
	May 31	June 16	17			0.00
	July 1	July 23	23	0.05	July 19	0.05
	Aug. 12	Aug. 31	20			0.00
	Oct. 4	Oct. 25	22			0.00
1903	Oct. 14	Dec. 11	59	0.08 0.08 0.12 0.02	Nov. 10 Dec. 1 Dec. 4 Dec. 8	
1904	No drought.					0.30
1905	Do.					
1906	Oct. 18	Nov. 16	30	0.01	Nov. 17	0.01
1907	July 14	July 28	15			0.00
	Aug. 6	Aug. 20	15			0.00
	Sept. 10	Oct. 1	22	0.05	Sept. 18	0.05
	Oct. 9	Oct. 28	20			0.00
1908	Aug. 24	Sept. 11	19			0.00
	Sept. 23	Nov. 1	35	0.11	Oct. 20	0.11
	Dec. 1	Dec. 27	27	0.09	Dec. 6	0.09
1909	June 30	July 14	15			0.00
	July 19	Aug. 5	18			0.00
	Sept. 10	Oct. 7	28	0.15	Sept. 21	0.15
1910	Apr. 16	May 5	20			0.00
	June 5	June 24	20			0.00
	July 13	July 29	17			0.00
	Sept. 7	Sept. 26	20			0.00
	Oct. 28	Dec. 21	55	0.11 0.21 0.04 0.02 0.16 0.12	Nov. 15 Nov. 16 Nov. 26 Dec. 6 Dec. 12 Dec. 13	
						0.66

1 For Center Point.

TABLE I—Continued

## Mena—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1911.....	May 31	June 17	18			0.00
1912.....	Jan. 19	Feb. 15	28			0.00
	May 29	June 12	15			0.00
	Aug. 23	Sept. 14	23			0.00
	Nov. 7	Nov. 30	24			0.00
1913.....	June 10	June 29	20			0.00
	Aug. 2	Sept. 7	37			0.00
1913.....	Dec. 26	Jan. 28	34	0.08	Jan. 25	0.08
1914.....	Aug. 28	Sept. 15	19			0.00
	Oct. 19	Nov. 7	20			0.00
1916.....	Mar. 4	Mar. 23	20			0.00
	Aug. 7	Aug. 31	25	0.03 0.06	Aug. 14 Aug. 23	0.09
	Oct. 20	Nov. 13	25			0.00
1917.....	Sept. 28	Oct. 17	20			0.00
1917.....	Dec. 9	Jan. 5	28			0.00
1918.....	Mar. 5	Apr. 2	29	0.06 0.02	Mar. 30 Mar. 31	0.08
	July 13	Aug. 6	25	0.01 0.12	July 18 July 28	0.13
1919.....	July 4	July 24	21	0.02	July 22	0.02
	Aug. 1	Aug. 15	15			0.00
1920.....	No drought.					
1921.....	Oct. 4	Oct. 28	25	0.01	Oct. 26	0.01
1922.....	Sept. 12	Oct. 5	24			0.00
1923.....	Aug. 1	Sept. 1	32			0.00
1924.....	Sept. 28	Nov. 6	40	0.15	Oct. 31	0.15
1925.....	Aug. 22	Sept. 11	21	0.02	Sept. 9	0.02
1926.....	Jan. 23	Feb. 16	25	0.02	Feb. 14	0.02
1927.....	June 22	July 14	23			0.00
	Aug. 10	Aug. 26	17	0.01	Aug. 18	0.01
	Sept. 9	Sept. 27	19			0.00
1928.....	Aug. 29	Oct. 6	39	0.07 0.03	Sept. 1 Oct. 5	0.10
1929.....	July 8	Sept. 4	59	0.01 0.22 0.04	Aug. 1 Aug. 9 Aug. 13	0.27
	Sept. 14	Oct. 2	19			0.00
	June 7	June 23	17			0.00
1930.....	June 26	Sept. 8	75	0.18 0.23 0.02	July 9 Aug. 1 Aug. 5	0.43

## Newport

1897.....	May 13	May 28	16			0.00
	Aug. 20	Oct. 30	72	0.21 0.35 0.10 0.08	Oct. 10 Oct. 11 Oct. 20 Oct. 28	0.74
1898.....	May 22	June 7	17			0.00
1899.....	Sept. 19	Oct. 9	21			0.00
1900.....	July 30	Aug. 22	24	0.25	Aug. 18	0.25
	Nov. 26	Dec. 18	23			0.00
1901.....	Apr. 19	May 11	23	0.04	Apr. 25	0.04
	June 17	Aug. 15	60	0.29 0.22 0.20 0.04 0.18 0.17 0.12	July 5 July 6 July 22 July 25 July 30 July 31 Aug. 11	1.22
	Aug. 25	Sept. 11	18			0.00
	Sept. 18	Oct. 7	20			0.00
1901.....	Dec. 18	Jan. 17	31			0.00
1902.....	July 1	July 19	19			0.00
1903.....	June 6	June 20	15			0.00
	Aug. 17	Sept. 10	25			0.00
1904.....	Oct. 7	Dec. 4	59	0.02 0.10 0.08 0.12 0.30 0.06	Oct. 11 Nov. 3 Nov. 4 Nov. 10 Nov. 21 Dec. 2	0.68
1905.....	No drought.					0.00
1906.....	Oct. 19	Nov. 10	23			0.00
1907.....	July 13	July 28	16			0.00
	Sept. 11	Sept. 27	17			0.00
1908.....	Sept. 29	Nov. 9	42	0.45 0.25	Oct. 24 Nov. 3	0.70
1908.....	Dec. 1	Jan. 4	35	0.35	Dec. 29	0.35
1909.....	June 18	Sept. 4	79	0.01 0.86 0.30 0.05 0.02 0.01 0.03 0.02 0.03 0.37 0.38	June 21 July 9 July 23 Aug. 11 Aug. 16 Aug. 19 Oct. 9 Oct. 10 Oct. 17 Oct. 20 Oct. 21	1.25
	Sept. 24	Oct. 31	38			0.83

TABLE I—Continued

## Newport—Continued

Year	Begin- ning—	End- ing—	Number of days	Precipi- tation	Date	Total
				<i>Inches</i>		<i>Inches</i>
1910.....	Jan. 19	Feb. 15	28	0.02	Feb. 3	0.02
	Mar. 11	Mar. 30	20			0.00
	July 14	Aug. 3	21			0.00
	Sept. 10	Sept. 24	15			0.00
	Oct. 22	Dec. 3	43	0.15 0.20 0.06 0.04	Nov. 5 Nov. 16 Nov. 27 Nov. 28	0.45
1911.....	May 2	May 20	19			0.00
	May 22	June 16	26			0.00
1912.....	May 17	June 13	28	0.06	June 2	0.06
	Aug. 28	Sept. 15	19			0.00
	Nov. 7	Dec. 4	28	0.10	Dec. 2	0.10
1913.....	May 23	June 6	15			0.00
	Aug. 19	Sept. 4	17			0.00
1914.....	May 7	July 1	56	0.01 0.01 0.37 0.01 0.01 0.04	May 12 May 28 June 2 June 13 June 16 June 17	0.45
1915.....	Aug. 28	Sept. 28	32			0.00
	Oct. 18	Nov. 7	21			0.00
1916.....	May 4	May 18	15			0.00
	June 24	July 19	26			0.00
	Aug. 15	Sept. 1	18			0.00
	Sept. 23	Oct. 18	26			0.00
	Oct. 20	Nov. 8	20			0.00
1917.....	May 5	May 21	17			0.09
	July 27	Aug. 20	25	0.20	Aug. 16	0.20
	Sept. 21	Oct. 25	35	0.10 0.10 0.30	Oct. 18 Oct. 19 Nov. 28	0.20
	Oct. 31	Dec. 7	38	0.05 0.15	Nov. 29 Feb. 19	0.35
1918.....	Jan. 29	Feb. 28	31	0.07	Mar. 24	0.07
	Mar. 1	Apr. 3	34			
	June 7	July 17	41	0.10 0.15 0.20 0.10	June 26 June 29 June 30 July 11	0.55
1919.....	July 25	Aug. 18	25			0.00
1920.....	Dec. 14	Jan. 6	24			0.00
1921.....	Jan. 15	Feb. 4	21			0.00
	May 12	June 8	28			0.00
	Oct. 9	Oct. 28	20			0.00
1922.....	June 14	June 28	15			0.00
	July 26	Oct. 5	72	0.28 0.39 0.08 0.15 0.80 0.50	Aug. 17 Aug. 27 Aug. 31 Sept. 1 Sept. 11 Sept. 20	2.20
1923.....	No drought.					
1924.....	Sept. 23	Nov. 11	50	0.08	Oct. 31	0.08
1925.....	May 15	May 30	16			0.00
	Aug. 22	Sept. 11	21			0.00
1925.....	Dec. 6	Jan. 2	28	0.10	Dec. 14	0.10
1926.....	July 10	July 24	15	0.03	Dec. 23	0.13
1927.....	June 22	July 14	23			0.00
	Sept. 5	Sept. 26	22	0.01	Sept. 19	0.01
	Oct. 13	Nov. 1	20			0.00
1928.....	July 29	Aug. 13	16			0.00
	Sept. 16	Oct. 1	16			0.00
1929.....	Aug. 13	Sept. 4	23			0.00
1930.....	June 17	Aug. 10	55	0.01 0.34 0.01 0.05	July 1 July 25 Aug. 1 Aug. 5	0.41

## Pocahontas

1897.....	June 20	July 17	28	0.04 0.04	July 10 July 15	0.08
	Aug. 18	Oct. 26	70	0.61 0.06	Oct. 10 Oct. 11	0.67
1898.....	No drought.					0.00
1899.....	Sept. 19	Oct. 9	21			0.00
1900.....	July 29	Aug. 21	24			0.00
1901.....	Apr. 18	Aug. 10	115	0.42 0.25 0.03 0.17 0.03 0.06 0.09 0.47 0.16 0.05 0.09 0.10 0.21	May 16 May 17 May 19 June 6 June 13 June 15 July 4 July 5 July 6 July 16 July 30 July 31 Aug. 4	2.13
	Aug. 28	Sept. 13	17			0.00

TABLE I—Continued

## Pocahontas—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				Inches		Inches
1901	Dec. 19	Jan. 19	32			0.00
1902	July 1	July 18	18			0.00
	Oct. 5	Oct. 25	21			0.00
1903	Jan. 3	Jan. 22	20			0.00
	June 6	June 20	16			0.00
	Aug. 16	Sept. 9	25			0.00
	Oct. 6	Dec. 2	58			0.00
1904	No drought.					
1905	Oct. 19	Nov. 7	20			0.00
1906	Sept. 16	Oct. 2	17			0.00
1907	June 14	June 28	15			0.00
1908	Aug. 23	Sept. 19	28	0.08	Sept. 4	0.08
	Sept. 28	Oct. 23	26			0.00
	Dec. 7	Dec. 28	22			0.00
1909	Aug. 8	Sept. 4	28	0.02	Aug. 16	0.02
1910	Mar. 11	Apr. 2	23			0.00
	Sept. 7	Sept. 23	17			0.00
	Nov. 6	Nov. 26	21			0.00
1911	No drought.					
1912	Aug. 19	Sept. 16	29			0.00
	Sept. 26	Oct. 17	22			0.00
	Nov. 7	Dec. 22	46	0.11	Dec. 1	0.11
1913	Apr. 27	May 14	18			0.00
1914	Jan. 3	Jan. 23	21			0.00
	May 7	July 1	56	0.70 0.05 0.35	June 11 June 15 June 20	1.10
1915	May 29	June 12	15			0.00
	Aug. 30	Sept. 17	19			0.00
	Oct. 18	Nov. 7	21			0.00
1916	June 24	July 19	26	0.23	July 12	0.23
	Aug. 3	Aug. 31	29	0.05	Aug. 16	0.05
	Oct. 20	Nov. 8	20			0.00
1917	June 10	July 1	22			0.00
	Aug. 30	Oct. 25	57	0.05 0.30 0.10 0.07 0.18 0.10 0.16 0.15 0.25	Sept. 8 Sept. 20 Sept. 27 Oct. 3 Oct. 8 Oct. 19 June 25 July 23 Aug. 8	0.80 0.16 0.40 0.00 0.01 0.01
1918	June 7	June 28	22			0.00
	July 11	Aug. 14	35			0.00
1919	Aug. 27	Sept. 17	22			0.00
1919	Dec. 14	Jan. 5	23			0.00
1920	June 4	June 18	15			0.01
1921	May 12	June 7	27			0.01
1922	No drought.					
1923	Do.					
1924	Oct. 6	Nov. 10	36	0.10	Oct. 31	0.10
1925	No drought.					
1926	June 11	July 6	26	0.05 0.08	June 22 June 25	0.13
1927	June 22	July 13	22			0.00
	Aug. 19	Sept. 25	38			0.00
1928	Sept. 1	Oct. 1	31	0.08	Sept. 15	0.08
1929	Aug. 13	Sept. 4	23			0.00
1930	June 16	July 22	37	0.05	July 7	0.05

## Rogers

1897	Aug. 19	Oct. 9	52	0.04 0.25 0.05 0.16 0.03	Aug. 30 Sept. 10 Sept. 14 Sept. 16 July 4	0.50 0.45 0.03 0.20
1898	Jan. 23	Mar. 9	46	0.45	Feb. 19	0.05
	June 28	July 19	22	0.03	July 4	0.00
	Sept. 22	Oct. 9	18			0.00
1898	Dec. 20	Jan. 29	41	0.05	Jan. 6	0.00
1899	Aug. 25	Oct. 15	52	0.85 0.02	Sept. 17 Oct. 10	0.87 0.00
1900	July 25	Aug. 22	29			0.00
1901	May 19	June 5	18	0.02	May 30	0.02
	June 20	July 12	23			0.00
1901	Dec. 18	Jan. 18	32	0.02	Jan. 4	0.02
1902	Dec. 21	Jan. 19	30	0.02	Jan. 4	0.05
	Nov. 5	Nov. 30	26	0.02	Nov. 24	0.02
1903	Dec. 25	Jan. 19	26			0.00
1904	Oct. 5	Jan. 8	96	0.34 0.02 0.03 0.04 0.04 0.06 0.60 0.04 0.20	Oct. 24 Nov. 3 Nov. 9 Nov. 10 Dec. 9 Dec. 17 Dec. 23 Dec. 26 Dec. 27	0.92 0.02 0.02 0.02 0.00 0.00 0.00 0.00 1.37

TABLE I—Continued

## Rogers—Continued

Year	Begin- ning—	Ending—	Number of days	Precipi- tation	Date	Total
				Inches		Inches
1906	May 6	May 30	25			0.00
	Oct. 16	Nov. 15	31	0.03 0.03	Oct. 23 Nov. 11	0.06 0.00
1907	Jan. 31	Feb. 22	23			
	June 28	Aug. 3	37	0.37 0.06 0.30	July 11 July 15 July 27	0.73 0.00 0.00
1908	Oct. 8	Oct. 31	24			
	Dec. 7	Dec. 28	22			
1909	July 27	Oct. 7	73	0.04 0.02 0.02 0.02 0.08 0.10 0.26 0.03	Aug. 8 Aug. 13 Aug. 14 Aug. 20 Aug. 29 Sept. 13 Sept. 14 Sept. 21	0.53
1910	Jan. 19	Feb. 15	28	0.02 0.05	Feb. 2 Feb. 9	0.07
1910	Oct. 28	Feb. 10	106	0.16	Nov. 5	
1911				0.02 0.03 0.02 0.01 0.32 0.42 0.72 0.79	Nov. 26 Dec. 4 Dec. 5 Dec. 6 Dec. 28 Dec. 29 Jan. 28 June 18	1.70 0.09 0.00 0.00
1912	June 1	June 21	21			
	Aug. 6	Aug. 21	16			
	Jan. 19	Feb. 8	21			
	July 1	Aug. 6	37	0.05 0.02 0.34 0.17 0.28	July 11 July 16 July 30 Aug. 2 Sept. 10	0.58 0.28
1912	Aug. 22	Sept. 16	26	0.02	Dec. 1	
1913	Nov. 7	Jan. 4	59	0.03 0.14	Dec. 23 Aug. 22	0.05 0.14
1913	July 28	Sept. 7	42			0.00
1914	Dec. 26	Jan. 24	30			0.00
1915	Nov. 9	Nov. 30	22	0.03	Nov. 28	0.08
	Aug. 24	Sept. 15	23			0.00
	Oct. 18	Nov. 7	21			0.00
1916	July 17	Aug. 30	45	0.09 0.48 0.05 0.08	July 31 Aug. 3 Aug. 18 Aug. 27	0.70 0.00 0.00
1917	Jan. 16	Feb. 13	29			
	May 5	May 19	15			
	Sept. 28	Nov. 16	50	0.02 0.48	Oct. 25 Oct. 29	0.50
1917	Dec. 10	Jan. 4	26			0.00
1918	June 13	June 28	16			0.00
	July 30	Aug. 13	15			0.00
1919	Aug. 30	Sept. 17	19	0.03	Sept. 15	0.03
1919	Dec. 10	Jan. 6	28			0.00
1920	Sept. 24	Oct. 14	21			0.00
	Nov. 2	Nov. 29	28	0.06 0.03 0.02 0.16 0.38 0.12	Nov. 8 Nov. 26 July 26 Oct. 7 Oct. 15 Oct. 16	0.09 0.02 0.00
1921	July 15	Aug. 2	19			
1922	Sept. 11	Oct. 31	51	0.02 0.16 0.38 0.12	Oct. 25 Oct. 29	0.50
1923	June 29	July 14	16			0.00
	July 31	Aug. 21	22	0.05	Aug. 14	0.05
1923	Dec. 23	Jan. 14	23			0.00
1924	May 1	May 19	19	0.09	May 15	0.09
	Sept. 3	Sept. 17	15			0.00
	Oct. 10	Oct. 30	21			0.00
1925	Feb. 24	Apr. 2	38	0.09 0.19	Mar. 13 Mar. 26	0.28 0.00
1925	Aug. 21	Sept. 9	20			
1926	Nov. 27	Jan. 1	36	0.03 0.05 0.03 0.02	Dec. 3 Dec. 4 Dec. 13 Dec. 14	0.13 0.00
1927	June 21	July 12	22			
	Aug. 30	Sept. 23	25	0.16 0.02	Aug. 13 Aug. 18	0.18 0.00
1928	Sept. 11	Oct. 4	24			
1929	July 8	Sept. 4	59	0.06 0.40 0.10 0.02 0.34 0.02	July 18 Aug. 8 Aug. 19 Aug. 21 Aug. 24 Sept. 20	0.92 0.02 0.00 0.00
1930	Sept. 13	Oct. 3	21			
	July 9	Aug. 3	26			
	Aug. 18	Sept. 5	19	0.02	Aug. 31	0.02

TABLE II.—Dry periods in 33 years by months for 12 stations

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
15 to 19 days	0	0	0	5	51	45	29	41	33	0	0	0	204
20 to 29 days	125	12	14	8	20	34	36	60	55	59	16	26	365
30 to 39 days	4	2	7	1	6	10	13	27	13	18	4	16	121
40 to 49 days	0	0	0	0	5	4	7	8	13	5	3	2	52
50 to 59 days	0	1	1	1	3	3	6	6	8	7	1	0	39
60 to 69 days	0	0	0	0	0	3	3	2	1	1	3	0	16
70 to 79 days	0	0	0	0	0	4	7	7	1	2	0	0	20
80 to 89 days	0	0	0	0	1	1	2	3	5	1	0	0	12
90 to 99 days	0	0	0	0	1	0	0	2	0	2	0	0	5
100 or more days	0	0	0	2	3	1	0	2	0	2	0	0	10
Total 12 stations, 33 years	32	15	22	19	96	108	103	159	125	96	27	44	844
Average number of periods per station per month and per year	0.08	0.04	0.06	0.05	0.24	0.27	0.26	0.40	0.32	0.24	0.07	0.11	2.13

TABLE III.—Dry periods at stations in 33 years

	15 to 19 days	20 to 29 days	30 to 39 days	40 to 49 days	50 to 59 days	60 to 69 days	70 to 79 days	80 to 89 days	90 to 99 days	100 or more days	Greatest number of days	Date began	Amount of precipitation
Arkansas City	28	33	12	7	4	1	4	2	1	1	105	Aug. 12, 1903	2.22
Camden	22	29	10	3	3	0	2	1	0	0	87	Aug. 2, 1929	2.21
Calico Rock	21	25	11	5	3	0	2	2	1	0	91	May 13, 1914	2.00
Dardanelle	22	35	17	9	3	1	2	0	0	2	125	Aug. 16, 1897	2.35
Fort Smith	8	25	16	3	5	4	1	2	1	1	103	Apr. 19, 1901	3.38
Fulton	23	33	9	8	3	2	1	1	1	2	112	Oct. 12, 1910	1.52
Helena	10	29	10	5	1	2	1	3	0	1	126	June 8, 1897	3.11
Little Rock	11	33	7	3	1	0	1	1	0	1	103	May 20, 1930	2.03
Mena	17	36	7	1	3	0	1	0	0	0	107	May 24, 1930	0.80
Newport	30	29	8	3	4	1	3	0	0	0	75	June 26, 1930	0.43
											79	June 18, 1909	1.25

TABLE III.—Dry periods at stations in 33 years—Continued

	15 to 19 days	20 to 29 days	30 to 39 days	40 to 49 days	50 to 59 days	60 to 69 days	70 to 79 days	80 to 89 days	90 to 99 days	100 or more days	Greatest number of days	Date began	Amount of precipitation
Pocahontas	10	28	6	1	3	0	1	0	0	1	115	Apr. 18, 1901	2.13
Rogers	12	30	8	4	6	0	1	0	1	1	106	Oct. 28, 1910	1.70
Total, 33 years	204	365	121	52	39	16	20	12	5	10			
Average number of periods per station per year	0.52	0.92	0.32	0.13	0.10	0.04	0.05	0.03	0.01	0.03			
Little Rock											138	July 8, 1887	3.34

TABLE IV.—Number of dry periods in 33 years with 15 days or more, 20 days or more, etc.

	15 days or more	20 days or more	30 days or more	40 days or more	50 days or more	60 days or more	70 days or more	80 days or more	90 days or more	100 days or more
Arkansas City	93	65	32	20	13	9	8	4	2	1
Camden	70	48	19	9	6	3	3	1	0	0
Calico Rock	75	54	29	18	13	10	5	3	1	0
Dardanelle	91	69	34	17	8	5	4	2	2	2
Fort Smith	66	58	33	17	14	9	5	4	2	1
Fulton	83	60	27	18	10	7	5	4	3	2
Helena	62	52	23	13	8	7	5	4	1	1
Little Rock	58	47	14	7	4	3	3	2	1	1
Mena	65	48	12	5	4	1	1	0	0	0
Newport	68	48	19	11	8	4	3	0	0	0
Pocahontas	50	40	12	6	5	2	2	1	1	1
Rogers	63	51	21	13	9	3	3	2	2	1
Total, 33 years	844	640	275	154	102	63	47	27	15	10
Average per station per year	2.13	1.62	0.69	0.39	0.26	0.16	0.12	0.07	0.04	0.025
Number of years per one occurrence	0.47	0.62	1.40	2.56	3.85	6.25	8.33	14.29	25.00	40.00

## DYNAMICAL PRESSURE EFFECT ON THE FRIEZ-TYPE AEROMETEOROGRAPH

By LOUIS P. HARRISON

[Weather Bureau, Washington, D.C., June 1933]

As is well known, the motion of air relative to an exposed object in general produces an excess of pressure over the static (or barometric) pressure on its windward side and a deficiency of pressure on its leeward side. The pressure which is recorded by an aerometeorograph mounted on a moving airplane is, therefore, subject to at least two influences which cause it to differ from the static pressure of the air at the same level. First, the motion of the airplane relative to the air produces a considerable deficiency of pressure for some distance above the wings and an excess of pressure for some distance below the wings. Second, the stream of air blowing past the aerometeorograph produces dynamical pressure effects such as are described in the first sentence, the reference pressure being what the pressure would be at the location of the aerometeorograph if the latter were absent.

The first source of error may be partially overcome by mounting the instrument on a biplane at some location between the wings where the effects of the upper and lower wings neutralize each other. In general, this position has been estimated to be somewhat nearer to the upper wing than to the lower, perhaps about two thirds of the way up, and perhaps two thirds of a chord length back of the leading edge of the upper wing. A difficulty is that the best location changes with change in angle of attack, etc. In the case of monoplanes, the instrument should be mounted as far below the wing as practicable and perhaps one half to two thirds of a chord length back from the leading edge. In any case, other disturbing elements, such as struts, etc., should be avoided as far as possible.

If the instrument is mounted in a place where the effect of the wings, struts, etc., can be considered negligible, the second source of error can be corrected for by the use of data obtained from wind-tunnel measurements and readings of the indicated air speed of the airplane. Such data for a Friez-type aerometeorograph (see figs. 1 and 2) have been obtained at the Aerodynamic Laboratory of the United States Bureau of Standards.

In the observations to this end, the instrument was mounted at the center of a wind tunnel. To determine the dynamic effect, two small copper tubes were introduced into the instrument with the open ends near the syphon pressure element, one at the side of the element pointing vertically upward, the other at the top of the element pointing horizontally. These tubes were connected through valves to one side of an inclined manometer of approximately 5 to 1 slope containing benzol. The other side of the manometer was connected to a small hole in the wall of the wind tunnel within which the air was at the static pressure of the tunnel. By this arrangement, small pressure differences could be accurately measured. Each tube could be connected in turn to the manometer. No significant difference was observed between the readings of the two tubes, and the average values were used.

The observations showed that the dynamic pressure effect caused the instrument to read too low, and that this deficiency of pressure,  $\Delta p$ , was proportional to the velocity pressure  $\frac{1}{2}\rho v^2$ , where  $\rho$  = density of the air, and  $v$  = velocity of the air. Thus, with the instrument in the normal flying position ( $0^\circ$  yaw) and over a range of speeds from 30 to 95 miles per hour in the tunnel the